CLAIMS

We claim:

1. A magnetic recording head for writing data onto a magnetic recording medium, the head comprising:

a first pole and a second pole separated by a gap;

a coil structure traversing through the gap;

a waveguide extending through the gap, in a plane distinct from the first pole plane and the second pole plane; and

a closure partially connecting the first pole and the second pole near the back gap to decrease a magnetic reluctance and increase a write efficiency of the recording head.

2. The device of claim 1 wherein the closure is split and wherein the waveguide travels through the split such that a light source can travel in a straight path from an entrance of the waveguide to the write gap area of the head.

3. The device of claim 2 wherein the light is transduced onto the magnetic recording medium.

4. The device of claim 1 wherein the waveguide is disposed between the first pole and the coil layer.

5. The device of claim 1 wherein the waveguide is disposed between the second pole and the coil layer.

6. A load beam assembly for transducing data with a concentric track of a magnetic recording medium, the assembly comprising:

a slider including an air-bearing surface;

a transducing head mounted on a trailing face of the slider, the transducing head having a first pole and a second pole;

a light source attached near the trailing face; and

a waveguide extending generally straight down from near an upper edge to near a lower edge of the trailing face, such that the waveguide is disposed in a distinct plane between the first and second poles.

7. The device of claim 6 wherein the light source is a solid-state laser diode.

8. The device of claim 6 further including a closure partially connecting the first pole and the second pole near the back gap to decrease a magnetic reluctance of the recording head.

9. The device of claim 8 wherein the closure is split to allow the waveguide to extend between a first portion and a second portion thereof.

10. The device of claim 6 wherein the transducing head further includes a transducing coil, the transducing coil extending between the first and the second poles.

11. The device of claim 6 wherein the laser source includes a laser emitting face and further wherein the laser emitting face is disposed generally opposing an upper face of the slider.

12. The device of claim 7 wherein the power output of the solid-state laser diode is sufficient to cause heating of a portion of the magnetic recording medium located near a write gap to a Curie temperature of the heat assisted recording medium.

13. The device of claim 6 further including a flexure adapted for supporting the slider and the light source.

14. The device of claim 13 further including a silicon bench assembly for changing a direction of a light beam exiting the light source.

15. The device of claim 6 wherein the light source is attached to the trailing face, such that a face of the light source is in contact with the trailing face.

16. A method of fabricating a head/load beam assembly for writing data to a concentric track of a magnetic recording medium, the method comprising:

providing a slider having an air bearing surface;

forming a transducing head on a trailing edge of the slider, the transducing head including a pole having a split back gap;

forming a waveguide on the trailing face of the slider, the waveguide extending through the split back gap; and

mounting a laser source near the trailing edge of the slider.

17. The method of claim 16 wherein the laser source is a laser diode having a power output from about 1 to about 25 mW.

18. The method of claim 16 wherein the laser source includes a light emitting face and further wherein the light emitting face is in optical communication with a proximal end of the waveguide.

19. The method of claim 16 further comprising providing a flexure for supporting the slider.

20. The method of claim 16 wherein the waveguide extends in a distinct plane between the pole and a transducing coil.